Name:

at1121exam_practice: Radicals and Squares (v611)

Question 1

Simplify the radical expressions.

$\sqrt{50}$	$\sqrt{44}$	$\sqrt{45}$
$\sqrt{5 \cdot 5 \cdot 2}$	$\sqrt{2 \cdot 2 \cdot 11}$	$\sqrt{3 \cdot 3 \cdot 5}$
$5\sqrt{2}$	$2\sqrt{11}$	$3\sqrt{5}$

Question 2

Find all solutions to the equation below:

$$\frac{(x+5)^2+5}{9} = 6$$

First, multiply both sides by 9.

$$(x+5)^2+5 = 54$$

Then, subtract 5 from both sides.

$$(x+5)^2 = 49$$

Undo the squaring. Remember the plus-minus symbol.

$$x+5 = \pm 7$$

Subtract 5 from both sides.

$$x = -5 \pm 7$$

So the two solutions are $x = 2$ and $x = -12$.

Question 3

By completing the square, find both solutions to the given equation. *You must show work for full credit!*

$$x^2 - 10x = -16$$

$$x^2 - 10x + 25 = -16 + 25$$
$$x^2 - 10x + 25 = 9$$
$$(x-5)^2 = 9$$
$$x - 5 = \pm 3$$
$$x = 5 \pm 3$$
$$x = 8 \quad \text{or} \quad x = 2$$

Question 4

A quadratic polynomial function is shown below in standard form.

$$y = 4x^2 + 24x + 44$$

Express the function in **vertex form** and identify the **location** of the vertex.

From the first two terms, factor out 4 .

$$y = 4(x^2 + 6x) + 44$$

We want a perfect square. Halve 6 and square the result to get 9 . Add and subtract that value inside the parentheses.

$$y = 4(x^2 + 6x + 9 - 9) + 44$$

Factor the perfect-square trinomial.

$$y = 4((x+3)^2 - 9) + 44$$

Distribute the 4.

$$y = 4(x+3)^2 - 36 + 44$$

Combine the constants to get **vertex form**:

$$y = 4(x+3)^2 + 8$$

The vertex is at point $(-3, 8)$.